Are the stock markets really responding to news on the FTA?: Event Study on Korea-US FTA

So-Young Ahn[a]
[a]Korea Institute of Origin Information

FTA 뉴스에 대한 주식시장의 반응 분석: 한-미 FTA 사건연구를 중심으로

안소영
국제원산지정보원 부연구위원

Abstract

Although there is a lot of literature on the effectiveness of regional trade agreements(RTAs), it is usually analyzed only using trade-related theories and data. However, this paper has a differentiation in that we examine the linkage between international trade and financial markets through the stock markets reactions when the trade agreements related news arrived. Specifically, using an event study, we look into the Korea-US free trade agreement(KORUS FTA) which is the most commercially significant FTA in almost two decades for both the countries. Korean stock market generally responded more sensitively to FTA news than the US stock market, especially in 'Auto & Parts', 'Electrical Equipment' and 'Chemicals' industries. And the investors' perception toward the effect of KORUS FTA on Korean industries changed from negative to positive as negotiations proceed. Korea has a comparative advantage in the production of labor-intensive goods relative to US, but the economies of scale hypothesis does not hold.

---

[a] First Author, E-mail: asy717@origin.or.kr

Ⅰ. Introduction and Motivation

Over the last two decades, regional trade agreements(RTAs) are an important phenomenon in the international trade environment. As already known, the RTAs are increasing dramatically in numbers and scales. Since being signed at national level, these trade agreements are relatively strongly binding to each other. Consequently, there is a greater impact on industries and individual firms that belong to the parties of trade agreements.

Although there is a lot of literature on the effectiveness of RTAs, it is usually analyzed only using trade-related theories and data. However, in our opinion, international trade and financial market have a close linkage, so the impact on the real market such as trade agreements brings long-term[1] and short-term effects on the financial markets where the countries are involved. But to the best of our knowledge, there are only a handful articles that analyze the effects of trade agreements on financial market[2], particularly stock market.

So in this paper, we examine the linkage between international trade and financial markets in the short-term looking at the stock markets reactions when the trade agreements related news arrived. Since the stock market is very sensitive to information, it is expected that observing the stock market's reaction will provide additional meaningful explanations for analyzing the trade market. For example, even though it is too soon to estimate the actual impact of the FTA, investors' expectations about the consequences of this agreement can be investigated using stock market data.

We look into the Korea-United States free trade agreement (KORUS FTA) for the following reasons: First, this agreement is the most commercially significant free trade agreement in almost two decades for both the countries.[3] Secondly, because Korea is the first North-East Asian partner of US FTA, the KORUS FTA is a model for trade agreements for the rest of the region, especially in the Asia-Pacific region. In this context, the contents and scopes of KORUS FTA are quite substantial, broad and well suited. At last, Korea is a small open economy and the stock market is highly sensitive, so we expect that analyzing KORUS FTA produces good results that we want to capture. US is a large open economy and has a stable and well-developed stock market, so it could be a nice control group to compare with.

With regard to methodology, we estimate abnormal stock market returns surrounding the implementation process of the KORUS FTA using an event study. Most empirical studies to date have been ex-post evaluation, but this method has problems in that it is hard to isolate the impact of trade policy changes from a large number of confounding factors (Tybout, 2003). Compared to traditional ex-post evaluation, the main advantage of the event study approach we have adopted is to minimize the number of confounding factors by usually using only one or two day's event windows.

---

1) In the long-run perspective, Ewing, Payne and Sowell (1999) study NAFTA and North American stock market linkage empirically.

2) Most studies of the impact of trade agreements on financial market are relevant to the FDI, especially inward FDI.

3) The International Trade Commission of US estimates that the reduction of Korean tariffs and tariff-rate quotas on goods will add 10 billion to 12 billion dollars to annual U.S. GDP and around 10 billion dollars to annual merchandise exports to Korea. And for Korea, the US market, which accounts for 22.5% of the global GDP(17.4 trillion dollars, based on IMF data of October 2014), is the second largest trading partner.

Following two primary questions are addressed in this paper: 1) For the KORUS FTA, did the FTA news have a significant impact on the stock market prices in both countries? 2) What does these stock market's responding mean concerning to the expected adjustments to free trade in terms of industry and individual firms?

To answer these questions, the rest of this paper is organized as follows. Section II investigates related literatures. Section III describes KORUS FTA and the selected events. Section IV explains the methodology with assumptions. Section V presents our data and discusses the empirical results. Section VI briefly concludes this paper.

Ⅱ. Related Literature

Thompson (1993/1994) investigate investors' expectations about the consequences of the Canada - United States Free Trade Agreement for manufacturing industries and firms in Canada. She find that industry-level abnormal returns correspond to only one event, reaching the agreement in October 1987. In firm-level, the results indicate that both comparative advantage and scale economies play a meaningful role in determining investors' perceptions of the impact of FTA.

Rodriguez (2003) extends the above Thompson's studies and examine investors' expectations of NAFTA's effect on the profitability of manufacturing industries in the USA, Canada and Mexico. The main finding is that the factor intensity which is the industry-wide labor-capital ratio is the most significant determinant of excess returns. But the results do not support the existence of a significant relationship among profits, trade liberalization and the relative scales of production of industries in NAFTA countries.

Parinduri and Thangavelu (2013) study the effects of the United States-Singapore Free Trade Agreement on the value of firms listed in the Singapore Exchange. They find that the removal of the last obstacle to the free trade deal in January 2003 increase the value of firms in some industries by 1~11% on average.

Moser and Rose (2014) assess the consequences of regional trade agreements (RTAs) on countries' welfare using national stock returns. They handle a recent data set that spans over 200 RTAs announcements, 80 economies and 20 years. They find the strong evidence of natural trading partner hypothesis which is stock markets rise more when RTAs were signed between the countries who already engaged in high volumes of trade. Stock markets also rise more when poorer countries signed RTAs, but there are no significant trade diversion effects in capital markets because of the RTAs.

Breinlich (2014) uses heterogeneous firm models to examine the stock market reactions to the Canada-United States Free Trade Agreement of 1989(CUSFTA). He derive testable predictions based on the models of Melitz (2003). In the uncertain circumstances surrounding the ratification of CUSFTA, he find that the Canadian manufacturing firm's abnormal returns closely matched the predictions related to export(US) tariff reductions, but rarely matched the predictions related to import(Canada) tariff reductions.

The methodology of this study is not very different from these papers above, but the data set is completely new and extensive. In addition, this paper is a comprehensive study using event study, and is meaningful in that it is the first attempt to investigate the reaction of the stock market following the conclusion of trade agreement in Korea.

Ⅲ. KORUS FTA and Description of Events

Based on the time of conclusion of the agreement, KORUS FTA was the first-largest FTA in Korea, and the second-largest FTA after the North American free trade agreement(NAFTA) in the United States. Also in 2010, Korea was the seventh-largest trading partner of the United States and the US was the second-largest trading partner of the Korea. This agreement was expected to increase bilateral trade and investment flows, and the final text of the proposed KORUS FTA covered a wide range of trade and investment issues. Therefore, KORUS FTA could have substantial economic implications for both the United States and Korea.[4]

The Governments of US and Korea initiated the negotiation on February 3, 2006(Event 1). There held 10 times of official rounds since the negotiation started, and the result of the negotiation was announced at the same time in the last day of each round.[5] The second round of negotiation on July 14, 2006(Event 2) did not progress smoothly because of the conflicts in the pharmaceuticals and medical equipments division. Then ranging from the third to the sixth rounds, there was no meaningful progress in the negotiation process. But by the seventh round of negotiation on February 15, 2007(Event 3), two parties agreed with on the strong commitment to a timely conclusion of the negotiation and they were highly sought to compromise on the main issues. At the eighth round of negotiation on March 13, 2007(Event 4), they laid the foundation for the final conclusion of the negotiation through achieving a significant progress in settling most of the subcommittees. Lastly, United States and Korean trade officials concluded trade agreements on April 02, 2007(Event 5) and they signed the proposed Korean-US free trade agreement(KORUS FTA) for their respective countries on June 30, 2007(Event 6).

But the Korea and United States concluded new agreements on December 3, 2010(Event 7), reflected in letters signed on February 10, 2011, which provided new market access and level the playing field for US auto manufacturers and workers. Congress approved the agreement on October 12, 2011(Event 9), and subsequently President Obama signed KORUS FTA on October 22, 2011(Event 10). Korea's National Assembly also approved it on November 22, 2011(Event 11). The United States and Korea completed their review of the measures both sides had taken to implement the FTA and exchanged diplomatic notes on February 21, 2012 agreeing that the agreement entered into force on March 15, 2012(Event 12).

As we have seen in the course of the negotiations, it took a long time the agreement enter into force after signing. The reasons could be considered as follows: 1) In US, the agreement could not enter into force unless Congress approved implementation legislation. But President Bush did not submit the legislation because of differences with the Democratic leadership over treatment of autos and beef, among other issues. Early in his administration, President Obama indicated the need to resolve those issues before he would submit the

---

4) According to the Korea-US FTA concession, almost 80 percent of the bilateral trade volume in consumer and industrial goods became duty free on the date of entry into force of FTA(March 15, 2012), and nearly 95 percent of bilateral trade volume became duty free within five years after that date. And also, most remaining tariffs would be eliminated within 10 years after entry into force.

5) For this reason, unpredictable assumption about the results is quite satisfied.

Table 1. Descriptions of Events

Event	Date	Direction	Description
1*	03-Feb-06 (02-Feb-06)	(+)	United States and Korea announced intention to negotiate Free Trade Agreement.
2	14-Jul-06 (14-Jul-06)	(−)	Second Round of Negotiations of KORUS FTA.
3	15-Feb-07 (14-Feb-07)	(+)	7th Round of Negotiations of KORUS FTA.
4	13-Mar-07 (12-Mar-07)	(+)	8th Round of Negotiations of KORUS FTA.
5*	02-Apr-07 (02-Apr-07)	(+)	United States and Korea concluded trade agreements.
6*	30-Jun-07 (30-Jun-07)	(+)	United States and Korea signed the KORUS FTA.
7*	03-Dec-10 (03-Dec-10)	(−)	United States and Korea concluded new agreements.
8*	04-May-11 (04-May-11)	(−)	The foreign Affairs, Trade and Unification Committee of KOREA withdrew ratification.
9*	13-Oct-11 (12-Oct-11)	(+)	US congress approved the agreement.
10	22-Oct-11 (21-Oct-11)	(+)	President Obama signed KORUS FTA.
11	22-Nov-11 (22-Nov-11)	(+)	Korea's National Assembly approved the agreement.
12	15-Mar-12 (15-Mar-12)	(+)	KORUS FTA entered into force.

Notes: 1. Korea is based on the date outside of the parentheses and US is based on the date inside of the parentheses. We have classified the baseline time by taking into account the release time of the news.
2. Especially, events which have an asterisk are important and satisfy unexpected conditions.
3. Cases that are favorable to the Korea-US FTA or favorable to Korea are classified in the (+) direction, and cases that are unfavorable to the Korea-US FTA or unfavorable to Korea are classified in the (−) direction.

implementing legislation. 2) In Korea, there were objections to the amended agreement on December 3, 2010. The foreign Affairs, Trade and Unification Committee of KOREA withdrew ratification consequently on May 4, 2011(Event 8). 3) Because of the global financial and economic crisis in 2008, the protectionism took place in the United States and trade agreement had become relatively less important.

The long negotiation process related to the implementation of FTA unfortunately make it difficult to identify which events really have influence on the investors' expectation.[6] Nevertheless, based on the news reported in the front-page of articles, we introduce the possible number of events into the model. And we let the data decide which announcements

---

6) Studies by Brown and Warner (1980) and Binder (1985) indicate that the ability of an event study to detect abnormal returns is substantially weakened in case it is not known the time precisely when market expectations is changed. Therefore, it is important to select the exact timing of meaningful events.

made investors surprised and which ones didn't. About 30 events, which are believed to change the investors' perceptions by many economists, politicians and business journalists, are drawn from a set of official events.[7] Then, through a data analysis of over 30 major events, the 12 most meaningful events were selected. These events are listed in 〈Table 1〉.

Ⅳ. Estimation Models

1. Measuring abnormal returns by industries and events

We measure abnormal returns by industries and events using the daily stock return data of individual firms. Following the most of event study literature, the abnormal return to security i at time t is defined as the simple prediction error of the modified market model. This model describes a linear relationship between the stock return of a firm i and market portfolio using ordinary least square(OLS) regression. In this section, we use a two-step procedure to estimate abnormal returns. First, we regress daily individual firms' return on daily market portfolio return[8] so as to estimate a firms' betas (capturing the comovement between the individual firm's return and the market portfolio return) and an associated intercept alpha. We use an estimation window that starts thirteen months before the event and ends a month before the announcement.[9]

That is, we estimate over the relevant estimation window as in Eq. (1):

$$\gamma_{it} = \alpha_i + \beta_i \gamma_{mt} + \varepsilon_{it}$$
$$t = T - 395 \cdots T - 30$$
$$(1)$$

where γ_{it} is the return to security i at time t, α_i is the stock-specific constant, β_i is the systematic(non-diversifiable) risk of security i, γ_{mt} is the return to the market portfolio, ε_{it} is a stochastic error term, and T is the day when the relevant FTA news are announced. Error term ε_{it} captures abnormal returns, caused by the arrival of unexpected news about the implementation of KORUS FTA. This is assumed to be a zero mean and constant variance over the estimation period.[10]

After estimating the coefficients $\{\widehat{\alpha_i}, \widehat{\beta_i}\}$ with least squares, we then use them to form one-day abnormal returns (AR_{it}) around the time of the FTA event. Consistent with the generally accepted event study methodology, we consider a very narrow window around the event date to control the releases of another firm-specific information. Abnormal stock returns are measured by taking the difference between the actual and expected returns from the market model for firm i. Our default measure of abnormal returns to security i at time t is in Eq. (2):

$$AR_{it} = \gamma_{it} - \widehat{\alpha_i} - \widehat{\beta_i}\gamma_{mt} \qquad (2)$$

We do this procedure separately for each event because the period of analysis is too long to use the one measure of the coefficients $\{\widehat{\alpha_i}, \widehat{\beta_i}\}$.[11] That is to say, we

---

7) To understand the process of KORUS FTA, we refer to the fact sheets, transcripts, speeches and press releases of two web sites : The United States Trade Representative(https://ustr.gov) and KORUS FTA Portal(www.fta.go.kr/us)

8) MSCI KOREA INDEX or MSCI US INDEX

9) This is to avoid allowing the estimation window

---

to be influenced by the announcement itself.

10) E(εit)=0, Var(εit)=σ2i

modify the Eq. (1) to Eq. (3) which follows:

$$\gamma_{it} = \alpha_{i1} + \beta_{i1}\gamma_{mt} +$$
$$\sum_{s=2}^{S} D_{os}(\alpha_{is} + \beta_{is}\gamma_{mt}) + \xi_{it} \tag{3}$$

where D0S is an dummy variable equals one for the pre-window days of event S and zero otherwise. In the second step, we estimate these abnormal returns by industries and compare the results between the countries. The baseline specification is in Eq. (4)[12]:

$$\widehat{AR}_{it} = \sum_{e=1}^{E} \gamma_{et} D_{et} + \epsilon_{it} \tag{4}$$

where Det is an dummy variable equals one for the tth day in event window E and zero otherwise. Our primary interest γ_{et} is the coefficient of event indicators which is an averaged ARs of industry that contains a firm i.

2. Assumption

Under the event study methodology, there are some assumptions to consider. First is the Efficient Markets Hypothesis that says markets are efficient in that security prices (Fama, 1970). According to this hypothesis, security prices fully reflect all available information and adjust immediately to the new information. Therefore, investors respond favorably to those firms which in

their views are likely to derive future benefits from this agreement. Another important assumption is that the information about the potential impact of KORUS FTA on firms is not be released until the day of event. The last assumption is that capital is specific a given sector. In this model, the real return to capital rises in sectors that are positively affected by trade policy and falls in sectors that are negatively affected by trade policy(Mussa, 1974; Neary, 1978).[13]

The null hypothesis is that all of the averaged abnormal returns in each industry I for a given event are equal to zero,

$$H0 : AR_{Ie} = 0 \quad \forall I \tag{6}$$

And the alternative hypothesis is that the announcement of news related to the KORUS FTA events has a positive(or negative) significant impact on the averaged abnormal returns of each industry I.

$$H1 : AR_{Ie} > 0 \text{ if event e is a positive}$$
$$\text{event to industry } I$$
$$< 0 \text{ if event e is a negative event} \tag{7}$$
$$\text{to industry } I$$

Consequently, event studies present a joint test of both the theory in question and the efficient markets hypothesis.

3. Data

To estimate Eqs. (3) and (4), we need the data of daily stock markets returns on

---

11) Because security i's systematic risks may change after event "s", we re-estimate market model parameter every event.

12) The straightforward one-step estimation is also available using the Eq. (5):

$$\gamma_{it} = \alpha_{i1} + \beta_{i1}\gamma_{mt} +$$
$$\sum_{s=2}^{S} D_{os}(\alpha_{is} + \beta_{is}\gamma_{mt}) + \sum_{e=1}^{E} \gamma_{et} D_{et} + \eta_{it} \tag{5}$$

13) Grossman and Levinsohn (1989) provide empirical evidence that supports the assumption that capital is not inter-sectoral mobile. They measure the sensitivity of stock market returns to the news related to the level of import prices. As a result, they could reject the hypothesis of perfect capital mobility in five of the six industries.

Table 2. Industry Composition and Number of Firms

Industry	Number of Firms	
	KOR	US
Auto & Parts	70	27
Beverages	7	14
Chemicals	80	54
Construction & Materials	83	49
Electronic & Electrical Equipment	101	112
Financial Services	38	88
Food Producers	51	57
Forestry & Paper	15	7
General Industrials	24	29
General Retailers	21	121
Health Care Equipment & Services	7	136
Household Goods & Home Construction	26	58
Industrial Engineering	82	74
Industrial Metals	56	26
Industrial Transportation	16	44
Leisure Goods	33	29
Media	32	56
Oil & Gas Producers	7	59
Personal Goods	58	41
Pharmaceuticals & Biotechnology	62	147
Software & Computer Services	55	115
Support Services	17	118
Technology Hardware & Equipment	116	178
Tobacco	1	6
Total	1058	1645

Source: Datastream

individual firms and market portfolio.[14] We obtain the daily stock market data of the US and Korea from the Datastream. Analysis period starts from thirteen months before the first event to ends right after the last event(i.e. From 4 January 2005 to 15 March 2012).[15]

We consider the firms whose stocks are listed on NYSE & NASDAQ in the US and

---

14) To obtain the daily stock returns of market portfolio, we use MSCI (Morgan Stanley Capital International) Indices of US and Korea.

15) Binder (1998) says this period is the standard length(about 1 year) in the event study literature for the pre-event window used to estimate the market model's parameters.

KOSPI & KOSDAQ in Korea throughout the entire analysis period. And as a result, we can find 1058 Korean companies and 1645 US companies that meet the criteria.

According to the composition of industry portfolios maintained by Datastream, individual firms are classified by 24 industries. In addition, if the data value is missing or entered incorrectly in the Datastream, we supplement the additional information by utilizing the data in KIS_Value. ⟨Table 2⟩ shows the industry composition and the number of companies in each industry.

Ⅴ. Estimation Results

1. Baseline results : Industry level abnormal returns

We estimate Eqs. (3) and (4) for 24 industries by countries using one-day event windows.[16] ⟨Table 3⟩ presents the results of Korea and ⟨Table 4⟩ presents the results of US.[17] There are 110 significant abnormal returns in Korea and 71 significant abnormal returns in US through the all events.[18] Moreover, the variation of the numbers of abnormal returns between the events is more larger in Korea. From these facts, the Korean stock market appears to be more sensitive to FTA news than the US stock market. First, let's look at the analysis results of each event through ⟨Tables 3 and 4⟩.

---

16) To reduce the noise that may arise in longer event-window period, we decide to use one-day event window basically.

17) The results of the United States are used as the control group in interpreting.

18) In contrast, in the article of Parinduri and Thangavelu (2013), almost all abnormal returns of the events are insignificant because of the predictability of the FTA negotiations in Singapore.

In Event 1, Korea has the largest numbers of 22 significant abnormal returns(ARs) except the 'Health Care Equipment & Services' and 'Oil & Gas Producers' industries. All the signs of ARs are negative except 'Tobacco' industry. That implies starting to negotiate FTA with US is not a good news for the investors in majority of industries in Korea. On the other hand, US has five significant ARs: four industries ('Auto & Parts', 'Electrical Equipment', 'General Retailers', 'Household Goods & Home Construction') have positive values and one industry ('Tobacco') has a negative value. According to economic theory, under the trade liberalization such as trade agreement, firms are divided into winners and losers[19] both inter-industry and intra-industry. And this is influenced by the comparative advantage of each industry and productivity, size and efficiency of firms. In case of Korea, as shown in the results, there are negative reactions from the majority of industries and firms significantly. So, it can be seen that the Korean stock market reacted to political or other factors rather than economic factors in Event 1.[20]

As mentioned in Section III, Event 2 which is the second round of negotiation did not progress smoothly because of the conflicts in the pharmaceuticals and medical equipment division. Korea has been affected little by this event, but US has negative significant ARs in 'Health Care Equipment & Services' and 'Pharmaceuticals & Biotechnology' industries. In Events 3 and 4, there is a mix of negative and positive reactions by the industry, despite significant progress in the negotiation

---

19) Sometimes firms have a neutral effect.

20) At the beginning of the negotiations, it may be difficult for the stock market to evaluate the economic effect accurately, as the details of the agreements have not been yet decided.

process.

Event 5 which concludes KORUS FTA shows eight significant ARs in Korea and four significant ARs in US. There are positive significant effects in 'Auto & Parts', 'Chemicals', 'Industrial Engineering' and 'Personal Goods' industries in Korea. On the other hand, in US, there are positive significant effects 'General Retailers', 'Media', 'Oil & Gas Producers' and 'Tobacco' industries. Meanwhile, negative significant effects are found in 'Construction & Materials', 'Financial Services', 'Health Care Equipment & Services' and 'Pharmaceuticals & Biotechnology' in Korea, but not found in US.

In Event 6, Korea and US signed the KORUS FTA and the final text of agreement was published. Surprisingly, all the 11 industries which have significant abnormal returns[21] in Korea represent positive signs. This is probably due to the opened final text which is good enough to increase future profits of Korean firms in those industries. However US shows positive signs in 'Auto & Parts', 'Beverages', 'Food Producers' and 'Industrial Metals' industries and negative signs in 'General Retailers' and 'Personal Goods'[22] industries.

There was a new agreement in Event 7 which provided new market access and level for US auto manufacturers and workers. Consequently, Korea has 11 negative ARs especially including 'Auto & Parts industry', but US has 5 positive ARs including 'Auto & Parts' industry.[23] But the Foreign Affairs,

Trade and Unification Committee of KOREA withdrew ratification of new agreement in Event 8. In that event, Korea has the 9 significant abnormal returns which are all positive, but US has the 7 negative signs and only has the 2 positive signs.

In Event 9 and 10, all relevant political and administrative procedures were finished in the United States. Event 9 shows 17 significant positive effects in Korea and 8 in US. There is no negative abnormal return in both countries. Event 10 shows 3 significant positive ARs and no negative effect in US, but there are mixed effects in Korea. Event 10 was less surprising news than Event 9 because President Obama's signing of the Korea-US FTA was an officially scheduled procedure.

In Event 11, only 3 significant abnormal returns are seen in Korea, which means that if the processes have already been completed in the United States, additional Korean political process is not significant enough to affect the abnormal returns. In addition, Event 12 is an important event of the KORUS FTA, but for similar reasons as Event 10, it does not meet the unpredictable conditions.

Next, let's look at the results by industries. In Korea, 'Auto & Part', 'Chemicals', 'Construction & Materials', 'Electrical Equipment', 'Pharmaceuticals & Biotechnology', 'Software & Computer Services' and 'Technology Hardware & Equipment' industries show more sensitive abnormal returns to the FTA news.[24] These industries are economically more important and larger in size for Korea. Meanwhile, 'Forestry & Paper', 'General

---

21) They are 'Auto & Parts', 'Chemicals', 'Construction & Materials'. 'Financial Services', 'Food Producers', 'Health Care Equipment & Services', 'Household Goods & Home Construction', 'Industrial Metals', 'Pharmaceuticals & Biotechnology', 'Software & Computer Services' and 'Tobacco' industries.

22) Personal Goods' industry contains clothing and textile industries.

---

23) In Event 7, Korea do not show any significant positive abnormal returns in any industry, but the US shows significant positive abnormal returns in industries other than the 'Tobacco' industry.

24) These industries have more than 7 ARs among the 12 cases.

Retailers', 'Health Care Equipment & Services' and 'Tobacco' industries are little affected[25] and 'Oil & Gas Producers' industry is not affected at all by the FTA related news. Overall, 'Auto & Parts', 'Chemicals' and 'Industrial Transportation' industries have positive signs in ARs, but 'Electrical Equipment', 'Financial Services', 'Pharmaceuticals & Biotechnology', and 'Technology Hardware & Equipment' industries have negative signs in ARs.

In US, industries on 'Auto & Parts', 'General Retailers', 'Household Goods & Home Construction', 'Industrial Engineering', 'Industrial Transportation' have more sensitive abnormal returns than others.[26] 'Beverages', 'Financial Services', 'Food Producers', 'General Industrials', 'Leisure Goods' and 'Software & Computer Services' industries are little affected[27] and 'Forestry & Paper' industry is not affected at all by the news. On the whole, 'Auto & Parts' and 'Household Goods & Home Construction' industries have positive signs in ARs, but 'Chemicals', 'Construction & Materials', 'Personal Goods' and 'Support Services' industries have negative signs in ARs.

To summarize the key results, Korean stock market seems to be more sensitive to the KORUS FTA news than that of US. In Korea, that news resulted in the negative significant ARs in the most of industries at the early stage of negotiations. It wasn't until Event 4 that positive ARs appeared in some industries. At Event 6, when the final text of the agreement was announced, all the significant ARs of 11 industries are positive. This means that the investor's attitude toward the effects of the KORUS FTA on the Korean

industry has changed from negative to positive over time. However, the 13 industries, including auto manufacturers which are affected directly by new agreement, have significantly negative ARs when Event 7 comes out. This means that investors consider Event 7 as a very bad news to the future profit of Korean firms in those industries. It is notable that the stock prices of the industries, which are not mentioned explicitly in the new agreement[28], also reacted negatively. It seems that the new agreement also affected the sentiment of investors in irrelevant industries. In the political process for entry into force, the decision of the US Congress which is prior to the approval of the National Assembly of Korea gave a more significant impact on the ARs of Korean industries.

In the United States, KORUS FTA related news generally lead to the positive significant abnormal returns of the US industries from the early stage of the negotiations. That is to say, the higher possibility of concluding negotiations brings about the more positive abnormal returns, and vice versa.[29] In addition, investors in the US stock market tend to respond more consistently to KORUS FTA news than investors in the Korean stock market.

Economically important and large industries have more significant abnormal returns in Korea when FTA news arrives. Meanwhile, the United States do not show such an aspect. Also, winners and losers differ by industries in Korea and US, which means that industrial structures of two countries are quite different. Only the 'Auto & Parts' industry has the significant positive values which are the same direction.

---

25) These industries have 2 ARs among the 12 cases.
26) These industries have more than 5 ARs among the 12 cases.
27) These industries have 1 ARs among the 12 cases.

28) This new agreement was led by US.
29) Compare Event 8 with Event 9 in the US stock market.

Table 3-a. Abnormal Return Tests by Industry Level(Korea)

Event	Auto & Parts	Beverages	Chemicals	Construction & Materials	Electrical Equipment	Financial Services	Food Producers	Forestry & Paper
1	-0.035 *** (0.004)	-0.037 ** (0.016)	-0.028 *** (0.004)	-0.035 *** (0.004)	-0.029 *** (0.004)	-0.052 *** (0.006)	-0.010 * (0.006)	-0.017 ** (0.008)
2	-0.002 (0.004)	0.016 (0.014)	0.001 (0.004)	-0.005 (0.004)	-0.008 ** (0.004)	0.004 (0.006)	0.007 (0.005)	0.000 (0.008)
3	-0.003 (0.004)	-0.021 * (0.011)	-0.001 (0.003)	-0.002 (0.003)	-0.009 ** (0.003)	0.001 (0.005)	-0.005 (0.004)	0.002 (0.007)
4	-0.005 (0.004)	0.001 (0.010)	0.003 (0.003)	-0.002 (0.003)	0.004 (0.003)	-0.009 ** (0.004)	0.001 (0.004)	0.005 (0.007)
5	0.035 *** (0.004)	0.006 (0.010)	0.006 ** (0.003)	-0.006 * (0.003)	0.002 (0.003)	-0.009 ** (0.004)	-0.001 (0.004)	0.006 (0.007)
6	0.010 ** (0.004)	-0.015 (0.011)	0.008 ** (0.003)	0.020 *** (0.004)	0.002 (0.003)	0.054 *** (0.005)	0.013 ** (0.004)	0.009 (0.007)
7	-0.012 ** (0.004)	-0.003 (0.009)	-0.008 ** (0.003)	-0.006 * (0.003)	-0.010 ** (0.004)	-0.005 (0.004)	-0.005 (0.004)	0.002 (0.006)
8	0.007 ** (0.004)	0.018 ** (0.009)	0.007 ** (0.003)	0.012 *** (0.003)	0.012 *** (0.003)	-0.002 (0.004)	0.012 ** (0.004)	0.001 (0.006)
9	0.009 ** (0.004)	0.022 ** (0.011)	0.008 ** (0.003)	0.009 ** (0.004)	0.010 ** (0.003)	-0.003 (0.004)	0.006 (0.004)	0.017 ** (0.006)
10	-0.006 * (0.004)	-0.010 (0.011)	0.000 (0.003)	0.007 ** (0.004)	0.005 (0.003)	0.000 (0.004)	0.005 (0.004)	0.001 (0.006)
11	0.001 (0.004)	-0.004 (0.012)	-0.004 (0.003)	-0.009 ** (0.004)	0.005 (0.003)	-0.001 (0.004)	-0.001 (0.004)	-0.002 (0.006)
12	-0.003 (0.004)	-0.004 (0.012)	-0.007 * (0.004)	-0.004 (0.004)	-0.006 * (0.004)	0.000 (0.004)	0.001 (0.005)	-0.005 (0.007)
#ARs	7	4	7	8	7	4	3	2
#Firms	70	7	80	83	101	38	51	15

Note: Significance at ***1, **5, *10 percent levels, respectively.

Table 3-b. Abnormal Return Tests by Industry Level(Korea_Continued)

Event	General Industrials	General Retailers	Health Care Equipment & Services	Household Goods & Home Construction	Industrial Engineering	Industrial Metals	Industrial Transportation	Leisure Goods
1	-0.020 **	-0.033 ***	-0.006	-0.031 ***	-0.033 ***	-0.034 ***	-0.030 ***	-0.025 **
	(0.008)	(0.008)	(0.020)	(0.008)	(0.004)	(0.005)	(0.009)	(0.008)
2	0.004	-0.003	0.019	-0.010	0.004	0.005	-0.002	-0.017 **
	(0.007)	(0.008)	(0.017)	(0.007)	(0.004)	(0.004)	(0.008)	(0.008)
3	-0.011	-0.008	-0.021	-0.008	-0.009 **	-0.001	-0.006	-0.006
	(0.006)	(0.007)	(0.014)	(0.006)	(0.004)	(0.004)	(0.008)	(0.006)
4	0.017 **	0.001	0.007	-0.004	0.005	0.002	-0.002	0.013 **
	(0.006)	(0.007)	(0.014)	(0.006)	(0.003)	(0.004)	(0.008)	(0.006)
5	0.006	-0.009	-0.025 *	0.004	0.008 **	0.005	-0.007	0.007
	(0.006)	(0.007)	(0.014)	(0.006)	(0.003)	(0.004)	(0.008)	(0.006)
6	0.004	0.001	0.028 **	0.015 **	0.004	0.011 **	0.012	0.001
	(0.006)	(0.007)	(0.014)	(0.006)	(0.004)	(0.004)	(0.008)	(0.006)
7	-0.010	-0.011 **	-0.004	-0.007	-0.013 ***	-0.010 **	-0.015 **	-0.008
	(0.006)	(0.005)	(0.012)	(0.005)	(0.003)	(0.004)	(0.008)	(0.005)
8	0.000	0.004	0.018	0.007	0.003	0.006	0.024 **	0.004
	(0.006)	(0.005)	(0.014)	(0.005)	(0.003)	(0.004)	(0.008)	(0.005)
9	0.017 **	0.000	0.017	0.014 **	0.010 **	0.011 **	0.026 ***	0.013 **
	(0.006)	(0.006)	(0.016)	(0.006)	(0.004)	(0.004)	(0.008)	(0.006)
10	0.003	-0.010	0.015	0.004	0.001	0.003	0.013 *	0.003
	(0.006)	(0.006)	(0.016)	(0.006)	(0.004)	(0.004)	(0.008)	(0.006)
11	-0.007	-0.006	-0.016	0.002	0.004	-0.012 **	-0.010	0.000
	(0.006)	(0.007)	(0.017)	(0.006)	(0.004)	(0.004)	(0.008)	(0.006)
12	-0.001	-0.009	-0.019	0.000	-0.006	-0.008 **	-0.004	-0.014 **
	(0.007)	(0.007)	(0.018)	(0.007)	(0.004)	(0.004)	(0.009)	(0.006)
#ARs	3	2	2	3	5	6	5	5
#Firms	24	21	7	26	82	56	16	33

Note: Significance at ***1, **5, *10 percent levels, respectively.

Table 3-c. Abnormal Return Tests by Industry Level(Korea_Continued)

Event	Media	Oil & Gas Producers	Personal Goods	Pharmaceuticals & Biotechnology	Software & Computer Services	Support Services	Technology Hardware & Equipment	Tobacco	#ARs
1	-0.015* (0.008)	0.010 (0.011)	-0.024*** (0.005)	-0.031*** (0.006)	-0.043*** (0.006)	-0.040*** (0.010)	-0.029*** (0.004)	0.035* (0.018)	22
2	-0.012 (0.008)	-0.015 (0.012)	-0.002 (0.005)	-0.003 (0.005)	-0.005 (0.006)	-0.009 (0.010)	-0.003 (0.004)	0.001 (0.023)	2
3	-0.015* (0.008)	-0.005 (0.012)	-0.013** (0.004)	-0.012** (0.004)	-0.012** (0.005)	-0.002 (0.008)	-0.007** (0.003)	-0.010 (0.021)	8
4	0.004 (0.008)	-0.014 (0.011)	0.002 (0.004)	-0.003 (0.004)	-0.004 (0.005)	0.020** (0.007)	-0.004 (0.003)	0.003 (0.019)	4
5	-0.012 (0.008)	0.004 (0.011)	0.019*** (0.004)	-0.010** (0.004)	-0.004 (0.005)	-0.008 (0.007)	0.000 (0.003)	-0.001 (0.016)	8
6	0.007 (0.007)	0.003 (0.016)	0.004 (0.004)	0.008** (0.004)	0.013** (0.005)	0.012 (0.008)	0.002 (0.003)	0.033*** (0.014)	11
7	-0.016** (0.006)	-0.012 (0.008)	-0.005 (0.004)	-0.008** (0.003)	-0.013** (0.005)	-0.023** (0.007)	-0.006* (0.003)	0.005 (0.013)	13
8	0.006 (0.006)	0.012 (0.008)	0.002 (0.004)	0.010** (0.003)	0.003 (0.005)	0.002 (0.008)	0.007** (0.003)	0.000 (0.014)	9
9	0.015** (0.007)	-0.005 (0.009)	0.021*** (0.004)	0.009** (0.004)	0.023*** (0.005)	0.006 (0.008)	0.011*** (0.003)	0.018 (0.015)	17
10	-0.013* (0.007)	0.001 (0.009)	0.002 (0.005)	-0.006* (0.004)	0.009* (0.005)	0.018** (0.008)	0.003 (0.003)	-0.024 (0.015)	7
11	0.019** (0.007)	-0.006 (0.010)	0.001 (0.005)	-0.002 (0.004)	0.002 (0.005)	-0.004 (0.008)	0.005 (0.003)	-0.002 (0.016)	3
12	0.000 (0.007)	-0.006 (0.007)	-0.001 (0.005)	-0.004 (0.004)	-0.010** (0.005)	-0.002 (0.008)	-0.008** (0.004)	0.011 (0.018)	6
#ARs	6	0	4	8	7	4	6	2	110
#Firms	32	7	58	62	55	17	116	1	1058

Note: Significance at ***1, **5, *10 percent levels, respectively.

Table 4-a. Abnormal Return Tests by Industry Level(US)

Event	Auto & Parts	Beverages	Chemicals	Construction & Materials	Electrical Equipment	Financial Services	Food Producers	Forestry & Paper
1	0.013 **	-0.001	0.000	0.002	0.011 **	-0.001	0.000	0.001
	(0.005)	(0.016)	(0.014)	(0.003)	(0.004)	(0.003)	(0.004)	(0.007)
2	0.002	-0.008	0.001	-0.010 **	-0.003	-0.003	-0.006	0.005
	(0.005)	(0.015)	(0.013)	(0.003)	(0.004)	(0.003)	(0.004)	(0.006)
3	-0.003	-0.010	-0.014 *	-0.010 **	-0.006	-0.002	-0.002	-0.001
	(0.005)	(0.012)	(0.008)	(0.003)	(0.004)	(0.010)	(0.003)	(0.006)
4	0.006	0.012	0.005	-0.007 **	0.002	-0.003	0.005	-0.001
	(0.005)	(0.012)	(0.008)	(0.003)	(0.003)	(0.069)	(0.003)	(0.006)
5	0.005	0.002	0.007	-0.002	0.003	-0.009	-0.002	-0.002
	(0.005)	(0.013)	(0.008)	(0.003)	(0.003)	(0.070)	(0.003)	(0.006)
6	0.018 ***	0.023 *	0.002	-0.005	0.002	0.004	0.008 **	-0.008
	(0.005)	(0.014)	(0.007)	(0.003)	(0.003)	(0.070)	(0.003)	(0.006)
7	0.012 **	0.008	0.002	-0.002	0.009 **	-0.005	0.000	-0.005
	(0.005)	(0.007)	(0.004)	(0.064)	(0.003)	(0.006)	(0.004)	(0.009)
8	-0.008	0.001	-0.010 **	-0.010	-0.008	-0.004	-0.001	-0.004
	(0.005)	(0.006)	(0.003)	(0.064)	(0.006)	(0.004)	(0.003)	(0.008)
9	0.001	0.007	0.006 **	0.015	0.007	0.007 *	0.005	0.009
	(0.005)	(0.006)	(0.003)	(0.064)	(0.006)	(0.004)	(0.003)	(0.008)
10	0.010 **	-0.004	0.002	-0.001	-0.005	-0.005	0.005	-0.010
	(0.005)	(0.006)	(0.003)	(0.064)	(0.006)	(0.004)	(0.003)	(0.008)
11	-0.002	-0.002	-0.010 **	-0.005	-0.002	-0.005	0.001	-0.011
	(0.005)	(0.006)	(0.003)	(0.004)	(0.006)	(0.004)	(0.003)	(0.008)
12	-0.010 *	-0.009	-0.001	0.009 **	0.003	0.002	-0.001	0.000
	(0.005)	(0.006)	(0.003)	(0.004)	(0.006)	(0.004)	(0.004)	(0.008)
#ARs	5	1	4	4	2	1	1	0
#Firms	27	14	54	49	112	88	57	7

Note: Significance at ***1, **5, *10 percent levels, respectively.

Table 4-b. Abnormal Return Tests by Industry Level(US_Continued)

Event	General Industrials	General Retailers	Health Care Equipment & Services	Household Goods & Home Construction	Industrial Engineering	Industrial Metals	Industrial Transportation	Leisure Goods
1	-0.002 (0.003)	0.010 *** (0.002)	-0.002 (0.003)	0.007 ** (0.003)	-0.001 (0.005)	0.010 (0.007)	0.002 (0.003)	0.002 (0.007)
2	-0.006 (0.004)	-0.008 *** (0.002)	-0.005 * (0.003)	-0.011 *** (0.003)	-0.010 ** (0.005)	-0.004 (0.007)	-0.013 *** (0.003)	-0.002 (0.007)
3	-0.002 (0.004)	-0.008 *** (0.002)	0.001 (0.003)	-0.006 (0.004)	0.000 (0.003)	-0.009 (0.009)	0.006 * (0.003)	0.001 (0.005)
4	0.003 (0.004)	0.002 (0.002)	0.001 (0.003)	-0.012 ** (0.004)	0.001 (0.003)	-0.005 (0.010)	0.001 (0.003)	-0.003 (0.005)
5	0.003 (0.004)	0.003 * (0.002)	0.001 (0.003)	-0.004 (0.004)	-0.002 (0.003)	0.005 (0.010)	-0.001 (0.003)	0.002 (0.005)
6	0.002 (0.003)	-0.003 * (0.002)	0.004 (0.003)	-0.005 (0.004)	0.006 (0.004)	0.019 * (0.010)	-0.002 (0.003)	0.001 (0.005)
7	0.002 (0.003)	0.006 ** (0.002)	0.001 (0.003)	0.000 (0.004)	0.006 ** (0.003)	0.004 (0.006)	0.002 (0.004)	0.004 (0.012)
8	-0.002 (0.003)	0.001 (0.002)	0.001 (0.003)	0.003 (0.003)	-0.011 *** (0.003)	-0.018 ** (0.006)	-0.006 * (0.003)	0.021 ** (0.010)
9	0.008 ** (0.003)	0.002 (0.002)	-0.003 (0.003)	0.009 ** (0.003)	0.011 *** (0.003)	0.011 ** (0.005)	0.028 *** (0.004)	0.003 (0.008)
10	-0.005 (0.003)	-0.003 (0.002)	0.006 ** (0.003)	0.009 ** (0.003)	-0.003 (0.003)	-0.004 (0.005)	-0.003 (0.004)	0.001 (0.008)
11	-0.004 (0.003)	-0.001 (0.002)	0.003 (0.003)	-0.001 (0.003)	0.005 * (0.003)	-0.005 (0.005)	-0.014 *** (0.004)	0.002 (0.008)
12	0.004 (0.003)	-0.003 (0.002)	0.003 (0.003)	0.007 ** (0.003)	0.001 (0.003)	0.002 (0.005)	0.014 *** (0.004)	0.000 (0.010)
#ARs	1	6	2	6	5	3	6	1
#Firms	29	121	136	58	74	26	44	29

Note: Significance at ***1, **5, *10 percent levels, respectively.

Table 4-c. Abnormal Return Tests by Industry Level(US_Continued)

Event	Media	Oil & Gas Producers	Personal Goods	Pharmaceuticals & Biotechnology	Software & Computer Services	Support Services	Technology Hardware & Equipment	Tobacco	#ARs
1	0.002 (0.004)	−0.009 (0.006)	0.005 (0.006)	0.004 (0.012)	0.002 (0.008)	0.002 (0.003)	0.000 (0.003)	−0.024 *** (0.007)	5
2	−0.004 (0.004)	0.008 ** (0.004)	−0.020 ** (0.007)	−0.009 ** (0.004)	0.003 (0.004)	−0.004 (0.003)	−0.004 (0.002)	0.011 (0.008)	9
3	0.003 (0.004)	−0.011 *** (0.003)	−0.014 ** (0.006)	0.019 *** (0.005)	−0.013 (0.053)	−0.006 ** (0.003)	0.000 (0.002)	0.000 (0.007)	8
4	0.009 ** (0.004)	−0.004 (0.003)	0.000 (0.005)	0.007 (0.004)	−0.002 (0.053)	0.000 (0.003)	0.004 * (0.002)	0.007 (0.007)	4
5	0.022 *** (0.004)	0.006 ** (0.003)	0.000 (0.005)	−0.002 (0.005)	−0.006 (0.053)	−0.002 (0.003)	−0.002 (0.002)	0.022 *** (0.006)	4
6	0.000 (0.004)	−0.002 (0.003)	−0.011 ** (0.005)	0.004 (0.004)	−0.008 (0.053)	−0.002 (0.003)	−0.002 (0.002)	−0.004 (0.006)	6
7	0.005 (0.006)	0.001 (0.003)	−0.001 (0.007)	0.003 (0.004)	−0.001 (0.027)	0.005 (0.003)	0.013 *** (0.004)	−0.034 *** (0.007)	6
8	−0.016 (0.206)	−0.017 *** (0.003)	0.005 (0.006)	−0.009 ** (0.004)	0.041 *** (0.006)	−0.007 ** (0.003)	0.002 (0.003)	−0.004 (0.006)	9
9	−0.010 (0.206)	0.000 (0.003)	0.008 (0.006)	−0.003 (0.005)	0.003 (0.006)	0.012 *** (0.003)	0.004 (0.003)	−0.005 (0.006)	8
10	−0.015 (0.206)	0.003 (0.003)	0.002 (0.005)	−0.004 (0.005)	−0.009 (0.006)	0.001 (0.003)	−0.003 (0.003)	−0.003 (0.006)	3
11	−0.011 (0.206)	−0.002 (0.003)	0.004 (0.006)	0.006 (0.005)	−0.003 (0.006)	−0.006 ** (0.003)	−0.009 ** (0.003)	−0.003 (0.006)	5
12	0.003 (0.006)	−0.002 (0.003)	−0.007 (0.012)	−0.002 (0.005)	0.000 (0.006)	0.000 (0.003)	0.001 (0.003)	−0.005 (0.006)	4
#ARs	2	4	3	3	1	4	3	3	71
#Firms	56	59	41	147	115	118	178	6	1645

Note: Significance at ***1, **5, *10 percent levels, respectively.

2. Further analysis considering cross-firm heterogeneity

Following Thomson's (1994) theoretical model, we additionally analyze the roles of comparative advantage[30] and economies of scale[31] in determining investors' perceptions of the consequences of the FTA. Labor-capital income ratio is used to measure comparative advantage and plant scale is used to measure economies of scale. Using yearly data of individual firm level[32], the average labor-capital ratio is calculated from the inverse of firm level capitals per employees[33] and relative plant scale is calculated from the difference between the average sale of firms in a industry in the US and that in Korea. In this chapter, we examine Event 1, Event 7, Event 6 and Event 9 which are the most important events.[34]

30) In this chapter, the comparative advantage is explained using Heckscher-Ohlin(H-O) hypothesis, which says that countries will export products that use their abundant and cheap factors of production and import products that use the countries' scarce factors. For example, if trade between the United States and Korea is based on the comparative advantage under H-O model, then, Korean firms that use intensively Korea's relatively inexpensive factors should benefit from the FTA.

31) Related to the trade liberalization, a number of emphases are placed on the potential gains to be achieved through the realization of economies of scale.

32) Data for these variable are obtained from Datastream.

33) The relative labor intensity of a firm is defined above as the ratio of labor income to capital income (i.e. wL/rK). But firm-level data on labor income are not available. So using the assumption that wages and return to capital are constant in each industries, we use the ratio of the number of employees to the value of firm's capital as a proxy.

34) All these events have significant abnormal returns more than ten industries. Event 1 and 7 bring abnormal returns over the negative direction. In

And we consider only Korean firms.

The modified version of Eq. (5) is as follows:

$$\gamma_{it} = \alpha_i + \beta_i \gamma_{mt} +$$

$$\cdot \sum_{e=1}^{E} D_{et} (\theta_{1ite} + \theta_{2e} LCR_{it} + \theta_{3e} Scale_{it}) + \eta_{it} \quad (8)$$

where LCR_{it} is the relative labor-capital intensity of firm i at time t, and $Scale_{it}$ is the relative plant scale of the industry that firm i is in at time t. Eq. (8) is estimated for two sets of event windows: the one-day event window and the two-day event windows[35]. ⟨Table 5⟩ represents the results.

contrast, Event 6 and 9 bring abnormal returns over the positive direction throughout the industries.

35) We set the two-day windows from t to t+1. Two-day abnormal returns are summed over event windows to form a cumulative abnormal return (CARie):

$$CAR_{ie} = \sum_{e=1}^{2} AR_{ie} \quad (9)$$

Table 5. Results Based on Four Events

	Event 1			Event 6			Event 7			Event 9		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Labor–capital ratio	0.035**	0.023**	0.045**	−0.014	−0.013*	−0.025*	0.006	0.011	0.023	0.009	0.014	0.029
	(0.015)	(0.011)	(0.021)	(0.010)	(0.007)	(0.04)	(0.015)	(0.011)	(0.024)	(0.021)	(0.015)	(0.030)
Relative scale	0.005	0.000	0.001	0.003	0.003	0.007	−0.003	0.000	0.000	0.000	−0.001	−0.002
	(0.005)	(0.004)	(0.007)	(0.005)	(0.003)	(0.007)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.005)
AR (1day)	−0.034***			0.010***			−0.009***			0.011***		
	(0.002)			(0.002)			(0.001)			(0.002)		
AR (2days)		−0.017***			0.010***			−0.004***			0.006***	
		(0.001)			(0.001)			(0.001)			(0.001)	
CAR			−0.034***			0.021***			−0.009***			0.012***
			(0.003)			(0.003)			(0.002)			(0.003)
Obs.	936	1872	936	899	1798	899	917	1834	917	861	1772	861
#Firms	936	936	936	899	899	899	917	917	917	861	861	861

Note: Significance at ***1, **5, *10 percent levels, respectively.

Table 6. Results on Firms whose Export Ratio is More than Mean in Total Samples

	Event 1			Event 6			Event 7			Event 9		
	(4)	(5)	(6)	(4)	(5)	(6)	(4)	(5)	(6)	(4)	(5)	(6)
Labor–capital ratio	0.000	0.037	0.074	0.036	−0.039	−0.078	0.025	0.045	0.000	0.071	0.030**	0.181**
	(0.041)	(0.030)	(0.060)	(0.049)	(0.038)	(0.073)	(0.089)	(0.029)	(0.060)	(0.062)	(0.042)	(0.084)
Relative scale	0.012	0.004	0.007	0.006	0.006	0.011	−0.001	0.003	0.005	−0.005	−0.003	−0.007
	(0.007)	(0.005)	(0.011)	(0.005)	(0.004)	(0.009)	(0.004)	(0.003)	(0.007)	(0.005)	(0.004)	(0.007)
AR (1day)	−0.035***			0.004			−0.009***			0.013***		
	(0.003)			(0.003)			(0.002)			(0.003)		
AR (2days)		−0.018***			0.009***			−0.006***			0.006**	
		(0.002)			(0.002)			(0.002)			(0.002)	
CAR			−0.037***			0.018***			−0.012***			0.012**
			(0.005)			(0.004)			(0.004)			(0.005)
Obs.	370	740	370	350	700	350	362	724	362	339	678	339
#Firms	370	370	370	350	350	350	362	362	362	339	339	339

Note: Significance at ***1, **5, *10 percent levels, respectively.

Table 7. Results on Firms who have Exported to US Between 2006 and 2012

	Event 1			Event 6			Event 7			Event 9		
	(7)	(8)	(9)	(7)	(8)	(9)	(7)	(8)	(9)	(7)	(8)	(9)
Labor-capital ratio	0.158** (0.072)	0.129** (0.054)	0.257** (0.105)	0.000 (0.078)	-0.017 (0.062)	-0.033 (0.132)	0.019 (0.050)	0.050 (0.041)	0.100 (0.082)	0.086 (0.111)	0.134* (0.072)	0.288* (0.144)
Relative scale	0.009 (0.008)	-0.003 (0.006)	-0.007 (0.012)	0.008 (0.007)	0.007 (0.005)	0.014 (0.011)	0.000 (0.005)	0.003 (0.004)	0.006 (0.008)	-0.006 (0.007)	-0.002 (0.004)	-0.005 (0.009)
AR (1day)	-0.039*** (0.004)			0.007** (0.003)			-0.010*** (0.002)			0.008* (0.004)		
AR (2days)		-0.020*** (0.003)			0.011*** (0.003)			-0.006*** (0.002)			0.002 (0.003)	
CAR			-0.039*** (0.005)			0.022*** (0.006)			-0.013** (0.004)			0.003 (0.005)
Obs.	215	430	215	205	410	205	217	434	217	197	394	197
#Firms	215	215	215	205	205	205	217	217	217	197	197	197

Note: Significance at ***1, **5, *10 percent levels, respectively.

Table 8. Results on Firms both in Table 6 and 7

	Event 1			Event 6			Event 7			Event 9		
	(10)	(11)	(12)	(10)	(11)	(12)	(10)	(11)	(12)	(10)	(11)	(12)
Labor-capital ratio	0.215** (0.088)	0.192** (0.066)	0.333** (0.134)	-0.042 (0.081)	-0.036 (0.074)	-0.071 (0.142)	-0.013 (0.048)	0.041 (0.043)	0.082 (0.086)	0.036 (0.136)	0.156* (0.088)	0.312* (0.181)
Relative scale	0.010 (0.010)	-0.003 (0.007)	-0.006 (0.015)	0.008 (0.006)	0.005 (0.006)	0.009 (0.011)	-0.001 (0.005)	0.001 (0.005)	0.003 (0.009)	-0.007 (0.008)	-0.003 (0.005)	-0.006 (0.011)
AR (1day)	-0.041*** (0.005)			0.007** (0.003)			-0.010*** (0.003)			0.007 (0.005)		
AR (2days)		-0.022*** (0.004)			0.012*** (0.003)			-0.006*** (0.002)			0.001 (0.004)	
CAR			-0.044*** (0.007)			0.023*** (0.006)			-0.013*** (0.004)			0.002 (0.007)
Obs.	145	290	145	134	268	134	141	282	141	129	258	129
#Firms	145	145	145	134	134	134	141	141	141	129	129	129

Note: Significance at ***1, **5, *10 percent levels, respectively.

Table 9. Results on Companies in KOSPI

	Event 1			Event 6			Event 7			Event 9		
	(13)	(14)	(15)	(13)	(14)	(15)	(13)	(14)	(15)	(13)	(14)	(15)
Labor–capital ratio	0.120***	0.035	0.071	0.059*	0.076***	0.153**	-0.064*	-0.002	-0.005	0.050	0.075*	0.149
	(0.032)	(0.024)	(0.043)	(0.034)	(0.023)	(0.047)	(0.035)	(0.028)	(0.057)	(0.064)	(0.044)	(0.091)
Relative scale	0.002	0.001	0.001	0.001	0.003	0.007	0.000	0.000	0.000	0.000	-0.001	-0.002
	(0.006)	(0.004)	(0.008)	(0.006)	(0.004)	(0.008)	(0.003)	(0.003)	(0.005)	(0.004)	(0.003)	(0.006)
AR (1day)	-0.035***			0.013***			-0.012***			0.009***		
	(0.002)			(0.002)			(0.002)			(0.002)		
AR (2days)		-0.018***			0.011***			-0.006***			0.004**	
		(0.002)			(0.002)			(0.001)			(0.002)	
CAR			-0.035***			0.022***			-0.012***			0.007**
			(0.003)			(0.003)			(0.003)			(0.004)
Obs.	494	988	494	455	910	455	438	876	438	405	810	405
#Firms	494	494	494	455	455	455	438	438	438	405	405	405

Note: Significance at ***1, **5, *10 percent levels, respectively.

As in the results of 〈Tables 3〉, from 〈Tables 5 to 9〉, Events 1 and 7 have the negative average ARs, and Events 6 and 9 have the positive average ARs. In Event 1, the labor-capital ratio variable has a positive coefficient, which indicates that investors believe Korea has a comparative advantage in the production of labor intensive goods compared with US. In that case, trade liberalization like KORUS FTA forces Korean firms to adjust from intensive use of capital to intensive use of labor. But in Event 6, the result comes out conversely. Consequently, it is difficult for us to confirm the industries where Korea has comparative advantage only through the 〈Table 5〉. In addition, we should not overlook the fact that the data we analyze contains data from all firms that do not export. Because of the existence of these firms, this analysis is not enough to judge the comparative advantages of Korea according to the H-O model. So, we add some analyses adjusting estimations to various levels.

〈Table 6〉 shows the results of analysis for firms whose exports are more than 25% of the total revenue.[36] And we can see that the coefficient of labor-capital ratio variable is significantly positive in Event 9. Meanwhile, 〈Table 7〉 is about the firms who have exported to US between 2006 and 2012. And 〈Table 8〉 is about the firms both in 〈Tables 6 and 7〉. Finally, 〈Table 9〉 is about only considering KOSPI companies, not including KOSDAQ firms.

As shown in 〈Tables 6 to 9〉, in the case of analyzing only exporting firms and KOSPI companies that are likely to be directly affected by exports due to the KORUS FTA, in all the results except for Event 7 in 〈Table 9〉, we can confirm that the coefficients of

labor-capital ratio are positive overall.

However, throughout the analyses, the coefficients of the plant scale variable are not statistically significant at every event and also the signs are not consistent. So we can not conclude that the economies of scale hypothesis[37] holds.

Ⅵ. Conclusion

This paper examines the reactions of Korea and US stock markets when the KORUS FTA related news release. First, selecting the crucial 12 events in the process of FTA, abnormal returns of 24 industries are analyzed in each event. The key results are as follows.

Korean stock market generally seems to be more sensitive to FTA news than US stock market. In the beginning of negotiations, Korean stock market reacted negatively to the KORUS FTA news in most industries. However, when KORUS FTA was signed and the final text of the agreements was announced, all the significant abnormal returns of industries were positive. This shows that the investors' perception toward the effect of KORUS FTA on Korean industries changed from negative to positive as negotiations proceed.

Meanwhile, when new agreements which provided new market access and level for US auto manufacturers and workers came out, the 13 industries including 'Auto & Parts' industry have negative ARs. There was no positive AR. This represents that investors consider the modification of the agreements

---

36) 25% is the average export proportion of the total samples.

37) According to this hypothesis, Korean firms in industries where the average plant scale is small relative to the United States are expected to experience losses during the adjustment to free trade.

as very bad news to the future profit of Korean firms in those industries. Thereafter the foreign Affairs, Trade and Unification Committee of KOREA withdrew ratification of new agreements. In that event, Korea has the 9 significant abnormal returns which are all positive, but US has the 7 negative signs and only 2 positive signs. As shown in the above, the stock markets generally have realized positive excess returns on the news which is favorable to the firms' future profits, and vice versa. Given that this analysis was based on the day the news was released, we can see that the stock markets in both countries meet considerably the efficiency market hypothesis we have previously assumed.

In addition, we should note that the direction of excess returns is similar in the majority of industries in each event. According to economic theory, under the trade liberalization such as trade agreement, industries are generally divided into two parts: winners or losers. So, only considering economic aspects, industries expected to benefit and industries expected to damage should have abnormal returns in different directions. However, the stock market did not display such an aspects, especially in Korea. As a results, this can be understood that stock markets would response to the political or sentimental factors as well as economic factors.

In the political process for entry into force, the decision of the US Congress which is prior to the approval of the National Assembly of Korea gave a more significant impact on Korea and US stock market. These results can be explained in connection with the problem of predictability because the approval of the National Assembly of Korea after the decision of the US Congress is a sort of verification procedures rather than a new decision. In other words, events which satisfy the unexpected condition bring more abnormal returns significantly.

In the United States, KORUS FTA related news generally leads to the positive significant abnormal returns of the US firms from the early stage of the negotiations. Also, investors in US stock market are likely to respond to the FTA news more consistently than those in Korea stock market.

Economically important and large industries such as 'Auto & Parts', 'Chemicals' and 'Electrical Equipment' industries react sensitively and have more significant abnormal returns in Korea when FTA news arrives. And it can be inferred that the industrial structures of the two countries are quite different in that the winners and losers appear differently by industry in the US and Korea. Only the 'Auto & Parts' industry has the significant positive values which are same direction in two countries.

Finally, in the perspective of comparative advantage and economies of scale, Korea has a comparative advantage in the production of labor intensive goods, but the economies of scale hypothesis does not hold. In that case, according to the H-O theory, trade liberalization by the KORUS FTA could potentially benefit industries or firms that intensively use labor rather than capital in Korea.[38]

---

38) Here, the term capital-intensive or labor-intensive industry is a concept when comparing relatively Korea and the US. Therefore, it does not mean capital-intensive or labor-intensive industries in an absolute aspect.

References

Binder, J. J. (1985), "Measuring the effects of regulation with stock price data", *The RAND Journal of Economics*, 167-183.

Binder, J. (1998), "The event study methodology since 1969", *Review of quantitative Finance and Accounting*, 11(2), 111-137.

Breinlich, H. (2014), "Heterogeneous firm-level responses to trade liberalization: A test using stock price reactions", *Journal of International Economics*, 93(2), 270-285.

Brown, S. J. and J. B. Warner (1980), "Measuring security price performance", *Journal of financial economics*, 8(3), 205-258.

Ewing, B. T., J. E. Payne and C. Sowell (1999), "NAFTA and North American stock market linkages: An empirical note", *The North American Journal of Economics and Finance*, 10(2), 443-451.

Fama, E. F. (1970), "Efficient capital markets: A review of theory and empirical work", *The journal of Finance*, 25(2), 383-417.

Grossman, G. M. and J. A. Levinsohn (1989), "Import competition and the stock market return to capital", *The American Economic Review*, 1065-1087.

Melitz, M. J. (2003), "The impact of trade on intra-industry reallocations and aggregate industry productivity", *econometrica*, 71(6), 1695-1725.

Moser, C. and A. K. Rose (2014), "Who benefits from regional trade agreements? The view from the stock market", *European Economic Review*, 68, 31-47.

Mussa, M. (1974), "Tariffs and the distribution of income: The importance of factor specificity, substitutability, and intensity in the short and long run", *Journal of Political Economy*, 82(6), 1191-1203.

Neary, J. P. (1978), "Short-run capital specificity and the pure theory of international trade", *The Economic Journal*, 88(351), 488-510.

Parinduri, R. A. and S. M. Thangavelu (2013), "Trade liberalization, free trade agreements, and the value of firms: Stock market evidence from Singapore", *The Journal of International Trade & Economic Development*, 22(6), 924-941.

Rodriguez, P. (2003), "Investor Expectations and the North American Free Trade Agreement", *Review of International Economics*, 11(1), 206-218.

Ahn, So-Young (2016), *Trade Agreements and Stock Markets* (Doctoral Dissertation), Seoul: Seoul National University

Thompson, A. J. (1993), "The anticipated sectoral adjustment to the Canada-United States Free Trade Agreement: An event study analysis", *Canadian Journal of Economics*, 253-271.

Thompson, A. J. (1994), "Trade liberalization, comparative advantage, and scale economies Stock market evidence from Canada", *Journal of International Economics*, 37(1), 1-27.

Tybout, J. R. (2003), *Plant-and firm-level evidence on 'new' trade theories*, Handbook of international trade, 1(1), 388-415.